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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,553	11/21/2001	Mohammed Abu Ayshi	2001-201	3508
7590	01/25/2005		EXAMINER	
LOUIS J. FRANCO LAW OFFICES OF LOUIS J. FRANCO-LUNENBURG 250 ARBOR STREET LUNENBURG, MA 01462			MARIAM, DANIEL G	
			ART UNIT	PAPER NUMBER
			2621	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/991,553

Applicant(s)

AYSHI ET AL.

Examiner

DANIEL G MARIAM

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/21/2001</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. Claims 1, 2, 4, 7, 11, 13, 15, 17, and 18 are objected to because of the following informalities: Each of the above-identified claims include a language (i.e., adapted to) that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure, and does not limit the scope of a claim or claim limitation, and thus raises a question as to the limiting effect of the language in a claim. The claims may be modified by replacing “adapted to” with “configured to or arranged to”. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3, 9-10 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the neural network is trained to recognize *variously configured versions of the same character* (emphasis added) by communicating to the neural network a plurality of variously configured feature vectors corresponding to variously configured character images (is this character image different form the above-identified character?) and instructing the neural network as to the desired output character to be associated with the variously configured feature vectors. Please clarify.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2, 4-8, 11-13 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stone, et al. (4,628,532) in view of Kuwano, et al. (6,501,856).

With regard to claim 7, Stone, et al. (hereinafter, Stone) discloses a character recognition system (See Figure 1) comprising: a data storage device (See for example, item 13, in Fig. 1); image acquisition apparatus adapted to capture an image of an object character and store the character image in the data storage device (See for example, item 10, in Fig. 1); feature extraction apparatus communicatively linked to the data storage device and adapted to receive the character image (See for example, item 28, in Fig. 1) and (i) algorithmically scan the character image along each scan angle of a (predetermined set of scan angles) in order to extract character features including bars (i.e., straight segment, bar, line and/or segments), and bays (i.e., features with concavity and/or disconnected segments), ascertainable along that scan angle (See for example, Figs. 3 and 4) and (ii) assemble a feature vector corresponding to the character image, the feature vector including data indicative of the character feature types present in the character image along each scan angle (See for example, col. 7, lines 14-51); and character recognition apparatus adapted to receive an assembled character feature vector from the feature extraction unit and recognize a character corresponding to the assembled feature vector at least

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partially on the basis of the quantity of each of (i) bars (ii) lakes and (iii) bays indicated in the feature vector (See for example, col. 20, line 7 through col. 21, line 23).

While Stone generally scans or traces various portions of the character image (See Fig. 2, for example), Stone does not expressly call for scan the character image along each scan angle of a predetermined set of scan angles in order to extract character features. However, Kuwano, et al. (See col. 29, line 60 through col. 30, line 15) teaches this feature. Stone and Kuwano, et al. are combinable because they are from the same field of endeavor, i.e., character feature extraction and recognition, i.e., (See the Abstract). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Stone with Kuwano, et al. The motivation for doing so is would at least minimize the processing time by scanning the character image along prescribed directions, such as eight directions of 0° , 45° , 90° , 135° , 180° , 225° , 270° and 315° (col. 29, lines 64-67). Therefore, it would have been obvious to combine Kuwano, et al. with Stone to obtain the invention as specified in claim 7.

Claim 1 is rejected the same as claim 7 except claim 1 is a method claim. Thus, argument analogous to that presented above for claim 1 is equally applicable to claim 1. Claim 1 distinguishes from claim 7 only in that it recites predefining a classification system in which each object character of a set of object characters is identifiable at least partially on the basis of a set of character feature types within a character image of the object character, the set of character feature types including (i) bars (ii) lakes and (iii) bays and providing an output indicating the identity of the object character; and rendering the assembled feature vector accessible to the character recognition apparatus for recognition of the corresponding character. These features are taught by Stone (col. 2, lines 18-33, Figs. 2 & 10) and (col. 5, lines 48-60) respectively.

With regard to claim 2, the method of claim 1 wherein the character recognition apparatus comprises a character dictionary and a comparator unit, the character dictionary containing a plurality of output character candidates, each output character candidate of the plurality of output character candidates having a corresponding standard profile, i.e., prototype, defined in terms of a combination of standardized character features including at least one of (i) a bar (ii) a lake and (iii) a bay and wherein the comparator unit is adapted to compare an assembled feature vector with standard profiles within the dictionary and identify as the recognized character the output character candidate corresponding to the standard profile that most closely resembles the assembled feature vector (See for example, for example, Figs. 2, 19, and 25 of Stone).

With regard to claim 4, the method of claim 1 wherein the feature extraction apparatus is further adapted to extract, and include in a feature vector, data relating to the spatial relationships a character feature has with other character features in the character image (See item 28, in Fig. 2 of Stone).

With regard to claim 5, the method of claim 1 wherein the character image comprises character image pixels including character pixels and background pixels (See for example, items 2006, 2007, in Fig. 29 of Kuwano, et al.) and the feature extraction apparatus is programmed to: (i) generate pixel-run representations of the character image from each angle of a predetermined set of algorithmic scan angles, (ii) distinguish background pixels from character pixels within an overall character image including an image boundary, (iii) identify and extract specified types of connected regions of (a) character pixels and (b) background pixels, the specified types of connected regions of character pixels including bars comprising two or more laterally adjacent

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character pixel-runs of at least one character pixel each, the connected regions of background pixels including lakes and bays, wherein a lake comprises laterally adjacent runs of background pixels within a connected region of background pixels that does not touch the image boundary and a bay comprises a non-boundary-touching subset of background pixel-runs within a connected region of background pixels that does touch the image boundary (See for example, Figs. 42-46, and 51; and col. 26, line 64 through col. 27, line 9 of Kuwano); and (iv) generate direction-specific data concerning the extraction of bars, lakes, and bays uniquely ascertainable from each of the predetermined algorithmic scan angles (See for example, Figs. 47 and 51 of Kuwano) .

With regard to claim 6, the character recognition method of claim 1 wherein the character image comprises character pixels within a field of background pixels and includes an image boundary comprised of edge pixels, and wherein: (i) a bar is a connected region of character pixels comprising two or more laterally adjacent character pixel-runs of at least one character pixel each (ii) a lake comprises laterally adjacent runs of background pixels within a connected region of background pixels that does not touch the image boundary and (iii) a bay comprises a non-boundary-touching subset of background pixel-runs within a connected region of background pixels that does touch the image boundary (See for example, Fig. 3, 9-11 of Stone).

Claim 8 is rejected the same as claim 5 except claim 8 is a method claim. Thus, argument similar to that presented above for claim 5 is equally applicable to claim 8.

Claim 11 is rejected the same as claim 2 except claim 11 is an apparatus claim. Thus, argument similar to that presented above for claim 2 is equally applicable to claim 11.

Claim 12 is rejected the same as claim 6 except claim 12 is an apparatus claim. Thus, argument similar to that presented above for claim 6 is equally applicable to claim 12.

Claim 13 is rejected the same as claims 1 and 5. Thus, arguments similar to those presented above for claims 1 and 5 are equally applicable to claim 13.

With regard to claim 15, the method of claim 13 wherein the data that the image-scanning algorithm is adapted to generate with respect to a character image includes at least one of: (i) the spatial relationships among bars, lakes and bays; (ii) the quantity of each of bars, lakes and bays (iii) the pixel count of each bars, lakes and bays; (iv) the number of direction-specific pixel runs in each bar, lake and bay; and (v) the centroid of each bar, lake, and bay (See item 28, in Fig. 2 of Stone).

With regard to claim 16, the method of claim 13 wherein the feature vector comprises data structures assembled in accordance with a predetermined protocol (See for example, Figs.3 and 21).

Claim 17 is rejected the same as claim 2. Thus, argument analogous to that presented above for claim 2 is equally applicable to claim 17.

With regard to claim 18, claim 1 encompasses each of the limitation of claim 18, and is rejected the same as claim 1. Thus, argument analogous to that presented above for claim 1 is equally applicable to claim 18.

Claim 19 is rejected the same as claim 6. Thus, argument analogous to that presented above for claim 6 is equally applicable to claim 19.


Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Numbers: 3930231, 4700400, 5583949, 6636631.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G MARIAM whose telephone number is 703-305-4010. The examiner can normally be reached on M-F (7:00-4:30) FIRST FRIDAY OFF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, LEO BOUDREAU can be reached on 703-305-4607. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


DANIEL MIRIAM
PRIMARY EXAMINER
January 21, 2005